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10/797,264	03/10/2004	Matthias H. Regelsberger	H10210/JDP	5357

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EASTMAN KODAK COMPANY  
PATENT LEGAL STAFF  
343 STATE STREET  
ROCHESTER, NY 14650-2201

EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

MAIL DATE	DELIVERY MODE
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11/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/797,264

Applicant(s)

REGELSBERGER ET AL.

Examiner

Hai C. Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,6,26-29,32-36 and 39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,6,26-29,32-36 and 39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**FINAL REJECTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1, 6, 29 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Sawada (JP 8-39860).

With regard to claims 1 and 6, Sawada discloses an image forming apparatus and a method for uniformizing exposure energy between respective LEDs while equalizing average exposure energy between respective LED chips (10-1 through 10-3), the method comprising calculating a light-output correction for each of a plurality of subsets of the LEDs (the LEDs 12 are organized into a plurality of groups or chips 10-1 to 10-3), each sub-set being controlled by a respective one of a plurality of different controllers (each of the plurality LED chips 10-1 to 10-3 is driven by a corresponding drive circuit 14-1 to 14-3) (Fig. 3) ([0041]-[0042]), each light-output correction being calculated based at least upon factors pertaining to (a) a light output from the LED subset associated with the light-output correction being calculated (the emission quantity is measured for each of the LEDs in a chip and the emission quantity correction adjusts the light intensity of each LED in the chip based on the measured emission quantity), and (b) an average light output from the plurality of subsets of the LEDs (the

average exposure energy is then measured for the LED chips 10-1 to 10-3, the measured average value is compared to the reference value and a drive current for each of the LEDs 12 is altered based on the result of the comparison), wherein each light-output correction facilitates correction of the light output from its associated LED subset as a function of applied voltage or supplied current (the emission quantity of each LED in the chip is adjusted by the corrected drive current in accordance with the result of the comparison between the measured average exposure energy of the respective LED chips and the desired value), adjusting the light output from the LED subsets as a function of applied voltage or supplied current in accordance with the corresponding light-output corrections (the correction of the emission quantity of each LED is corrected from chip to chip by altering the corresponding drive current), wherein each of the plurality of subsets of the LEDs includes more than one LED (each of the LED chips 10-1 to 10-3 comprises 64 LEDs 10-1 to 12-64) (Fig. 3) (see Abstract).

With regard to claims 29 and 36, Sawada further teaches the calculating step involving using difference data describing a difference between a factor pertaining to (a) and a factor pertaining to (b) (the correction of the emission quantity of the LEDs in the plural LED chips involves measuring the emission quantity of the LEDs in a chip and the subsequent measuring of the average exposure energy of each LED chip to correct the quantity of light of each chip so as to make the average exposure energy of the LED chips equal to each other, thus implying comparing the deviation of the emission quantity of the LEDs with respect to the measured average).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 26-27 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada in view of Uebbing et al. (US 4,982,203).

Sawada discloses all the basic limitations of the claimed invention except for the factors pertaining to the above-mentioned (a) and (b) including linear functions of light output versus applied voltage or supplied current and non-linear functions of light output versus applied voltage or supplied current.

Uebbing et al. discloses an apparatus and a method for providing correction for amount degradation in the light output of the light source in an electrophotographic recording device, wherein to obtain the amount of compensation for degradation in light output, the average amount of light output for the print head is measured at various temperatures and as a function of the supplied current, the supplied current being provided by varying the system reference voltage  $V_R$  (col. 2, line 51 to col. 3, line 2) (col. 6, lines 24-65). Uebbing et al. further teaches the amount of compensation for the light output of the light recording elements including a factor as a linear function of light output versus supplied current (i.e., factor  $x \cdot I$ , where  $I$  is the supplied current and  $x$  the current non-linearity coefficient) (see Equation (4) at col. 6, line 34). Uebbing et al. further teaches that alternatively, the amount of compensation for the light output of the

light recording elements including a factor as a non-linear function of light output versus supplied current (using partial derivatives as in Equation (6) at col. 7, line 5) (col. 6, line 66 to col. 7, line 15).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Sawada by incorporating the linear and/or non-linear functions of light output versus supplied current as taught by Uebbing et al. The motivation for doing so would have been to accurately correct the light output of the light recording elements through a range of the supplied current such that the uniform light output of the print head is more suitable for precision gray scale printing as suggested by Uebbing et al.

5. Claims 28 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada in view of Uebbing et al., as applied to claims 1 and 6 above, and further in view of Kawabe et al. (US 5,812,176).

Sawada, as modified by Uebbing et al., discloses all the basic limitations of the claimed invention except for the factors pertaining to (a) and (b) including quadratic functions.

Kawabe et al. discloses an image forming apparatus and a correction method for compensating the fluctuation of the exposure amount of each of the recording element, by measuring three times the brightness  $E_i$  of each of the recording element, calculating the averaged value  $E_o$  of all brightness values to be used as the reference brightness  $E_o$  and forming the ratio of the measured brightness  $E_i$  and the reference brightness  $E_i$ , to

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be used as the compensation data  $C_i$ , to be used to alter the output emission of the target recording element to compensate for the fluctuation of the brightness of target recording element (col. 25, line 50 to col. 26, line 20). Kawabe et al. further teaches the brightness of one of the recording element can be calculated by using a quadratic function corresponding to characteristics of the used array of the LEDs (col. 24, line 47-55) (col. 25, lines 39-49).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Sawada by using the quadratic function corresponding to characteristics of the used array of the LEDs to derive the light amount of the target LED as taught by Kawabe et al. since Kawabe et al. teaches this to be known in the art to use the quadratic function to obtain the same resulting amount of light for the individual light recording element.

6. Claims 32 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada in view of Uebbing et al., as applied to claims 1 and 6 above, and further in view of Bollandsee et al. (US 5,640,190).

Sawada in view of Uebbing et al. discloses all the basic limitations of the claimed invention except for the plural subsets including the plurality of LEDS includes a plurality of LEDS having substantially similar light-output-versus-applied-voltage or -supplied-current.

Bollandsee et al. discloses an LED printer whose print head includes a plurality of subsets of LEDs, wherein the average of light output of each subset is adjusted by

providing a current proportional to the correction factor (col. 5, lines 17-23), and wherein the subsets of LEDs are grouped by classes having about the same correction factor (col. 11, lines 13-30).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Sawada by incorporating subsets of light emitting elements having similar light-output-versus-applied-voltage or -supplied-current as taught by Bollandsee et al. The motivation for doing so would have been to allow the print head to provide a more uniform light distribution.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1, 6, 26-29, 32-36 and 39 have been considered but are moot in view of the new grounds of rejection.

### ***Conclusion***

8. Applicant's amendment, which changed the scope of the base claims, necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the



shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



HAI PHAM  
PRIMARY EXAMINER  
November 16, 2007